

External Technical Review Summary

United States Department of Energy Office of Environmental Management (DOE-EM)

External Technical Review of Disposal Practices at the Nevada Test Site

Why DOE-EM Did This Review



Radioactively contaminated materials from the Nevada Test Site (NTS), other DOE

facilities and other federal agencies are disposed of at NTS at two low-level radioactive waste (LLRW) management sites: Areas 3 and 5. Disposal operations at Area 3 have been discontinued, but the facility is available for future disposal. The anticipated closure date for Area 3 is 2027. Area 5 is operating and will be expanded to accept future wastes. LLRW and mixed low-level radioactive waste (MLLW) are disposed of in Area 5 in shallow (3-15 m deep) unlined trenches and pits. The MLLW unit will be closed in 2011 or when capacity is reached. *The objective of this review was to evaluate the performance and the ultimate closure of Area 5's LLRW and MLLW disposal operations at the NTS.*

What the ETR Team Recommended

1. Since waste placement and disposal operations can affect the long-term stability of the final cover, previous studies should be reviewed and updated consistent with current scientific data within and external to DOE.
2. Although prior analysis supports the use of unlined landfills at NTS, it would be beneficial to review the merits of both lined and unlined landfills for future applications at NTS.
3. Automation of processes, monitoring and record keeping should be explored for application to waste acceptance and landfill operations to improve cost effectiveness and performance.

4. Closure plans for RCRA and non-RCRA disposal facilities should consider long-term performance, sustainability with minimal maintenance and/or intervention, monitoring and long-term stewardship.
5. DOE experience in maintaining Uranium Mill Tailings Remedial Action (UMTRA) facilities should be applied when designing closures and new cells to ensure the designs are congruent with the natural setting.

What the ETR Team Found

The independent review team notes that Area 5 of NTS is in an arid and remote location where ground water is very deep and found no issues that could pose immediate problems. NTS conditions are ideal for containment and isolation of radioactive waste.

In addition, the relatively thick cover profile, the design based on natural principles, and the local hydrology of the vadose zone at NTS make water intrusion a less important issue than at other sites. Results of the lysimeter study at Area 5 have shown that a cover system employing natural principles can limit flow into underlying waste to very small amounts. This design is more flexible than conventional covers with barrier layers and therefore is less susceptible to formation of defects in response to distortion caused by settlement or seismic events. However, a plan should be developed that includes the frequency of inspection, methods that will be used to identify defects, and procedures that will be followed to repair defects that are encountered during the institutional control period.

Lessons learned in stakeholder interactions could be particularly valuable to other DOE sites. NTS's success in operating LLRW and MLLW disposal facilities with the Yucca Mountain debate in the background is a testament to the importance of this long-term relationship. Documenting or sharing in a workshop, good practices for stakeholder interactions could be a significant benefit to other sites.

To view the full ETR reports, please visit this web site:
<http://www.em.doe.gov/Pages/ExternalTechReviews.aspx>

July 2009

The purpose of an External Technical Review (ETR) is to reduce technical risk and uncertainty. ETRs provide pertinent information for DOE-EM to assess technical risk associated with projects and develop strategies for reducing the technical risk and to provide technical information needed to support critical project decisions. Technical risk reduction increases the probability of successful implementation of technical scope. In general, ETRs assesses technical bases, technology development, and technical risk identification and handling strategies.



EM Environmental Management

safety ❖ performance ❖ cleanup ❖ closure

www.em.doe.gov